

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2005/011000

International filing date (day/month/year)  
09.06.2005

Priority date (day/month/year)  
11.06.2004

International Patent Classification (IPC) or both national classification and IPC  
C08G63/08, C08G63/688, C08G63/685, C08G63/91

Applicant  
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#### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

#### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

#### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/JP2005/011000**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or  
Industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-2,6,8
	No: Claims	3-5,7
Inventive step (IS)	Yes: Claims	1-2,6,8
	No: Claims	3-5,7
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**Box No. VIII Certain observations on the International application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Cf V:**

**Reference is made to the following documents:**

- D1: SAULNIER B., PONSART S., COUDANE J., GARREAU H. & VERT M.: "Lactic acid-based functionalized polymers via copolymerization and chemical modification" MACROMOLECULAR BIOSCIENCE, vol. 4, no. 3, 2004, pages 232-237, XP002339168
- D2: US-A-5 610 241 (LEE ET AL) 11 March 1997 (1997-03-11)
- D3: US-A-4 265 247 (LENZ ET AL) 5 May 1981 (1981-05-05)
- D4: FR-A-2 765 228 (CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS) 31 December 1998 (1998-12-31)
- D5: HIRONOBU FUKUZAKI ET AL: "SYNTHESIS OF BIODEGRADABLE COPOLY(L-LACTIC ACID/AROMATIC HYDROXYACIDS) WITH RELATIVELY LOW MOLECULAR WEIGHT" EUROPEAN POLYMER JOURNAL, PERGAMON PRESS LTD. OXFORD, GB, vol. 26, no. 12, January 1990 (1990-01), pages 1273-1277, XP000205044 ISSN: 0014-3057
- D6: WHITESELL J K ET AL: "Homochiral and Heterochiral Polyesters: Polymers Derived from Mandelic Acid" CHEMISTRY OF MATERIALS, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 2, 1990, pages 248-254, XP002167703 ISSN: 0897-4756
- D7: CAMMAS S., BÉAR M-M, MOINE L., ESCALUP R., PONCHEL G., KATAKOA K., GUÉRIN P.: "Polymers of malic acid and 3-alkylmalic acid as synthetic PHAs in the design of biocompatible hydrolyzable devices" INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES, vol. 25, 1999, pages 273-282, XP002339169
- D8: PONSART S., COUDANE J., VERT M.: "A novel route to poly( $\epsilon$ -caprolactone)-based copolymers via anionic derivatization" BIOMACROMOLECULES, vol. 1, 2000, pages 275-281, XP002339170
- D9: YIN M. & BAKER G.L.: "Preparation and Characterization of substituted polylactides" MACROMOLECULES, vol. 32, no. 23, 1999, pages 7711-7717, XP002339171
- D10: YAMAKOA T., HOTTA Y., KOBAYASHI K., KIMURA Y.: "Synthesis and properties of malic acid-containing functional polymers" INTERNATIONAL

JOURNAL OF BIOLOGICAL MACROMOLECULES, vol. 25, 1999, pages  
265-271, XP002339172

**Article 33(2) PCT:**

**Claim 1:**

None of the documents discloses the same combination of features as disclosed in **claim 1**.

Thus, the subject matter of **claim 1** meets the requirements of Article 33(2) PCT.

The same remark applies also to **claim 6**.

**Claim 3:**

**Claim 3** discloses a method for making a polyhydroxyalkanoate.

**Document D1** discloses the same combination of technical features as disclosed in **claim 3** (pages 235-235, figures 3-4)

Thus, the subject matter of **claim 3** does not meet the requirements of Article 33(2) PCT.

The same remark applies also to **claim 4**.

**Claim 5:**

**Claim 5** discloses a method for making a polyhydroxyalkanoate.

**Document D1** discloses the same combination of technical features as disclosed in

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AUTHORITY (SEPARATE SHEET)**

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**claim 5** (pages 235-235, figures 3-4)

Thus, the subject matter of **claim 5** does not meet the requirements of Article 33(2) PCT.

The same remark applies also to **claim 7**.

**Claim 8:**

None of the documents discloses the same combination of features as disclosed in **claim 8**.

Thus, the subject matter of **claim 8** meets the requirements of Article 33(2) PCT.

**Article 33(3) PCT:**

**Claims 3 to 5 and 7:**

The subject matter of **claims 3 to 5 and 7** does not meet the requirements of Article 33(3) PCT.

**Claims 1, 6 and 8:**

**Document D1** is considered as representing the closest prior art. The difference between **claim 1** and **D1** is that in **D1**, the substituent has no amide nor sulphonic acid residues. Since there are no comparative examples in accordance with **D1**, the objective technical problem is to provide further PHA being substituted.

There are no indications in the prior art documents to modify the PHAs such as disclosed in **claim 1**. Therefore, an inventive step should be acknowledged.

Thus, the subject matter of **claim 1** meets the requirements of Article 33(3) PCT.

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The same remark applies also to **claims 6 and 8**.

**Article 33(4) PCT:**

The subject matter of **all claims** is capable of industrial applicability.

**Cf VIII:**

**In claim 3** there is a discrepancy between the number of the formula of the PHA and the number indicated.